ABResearch Notes

ABR, Inc.–Environmental Research & Services

Main Office: P.O. Box 80410 Fairbanks, AK 99708

P.O. Box 249 Forest Grove, OR 97116 ✦ P.O. Box 240268 Anchorage, AK 99524 ✦ 15 Bank Row, #B, Greenfield, MA 01301

Fall 2008

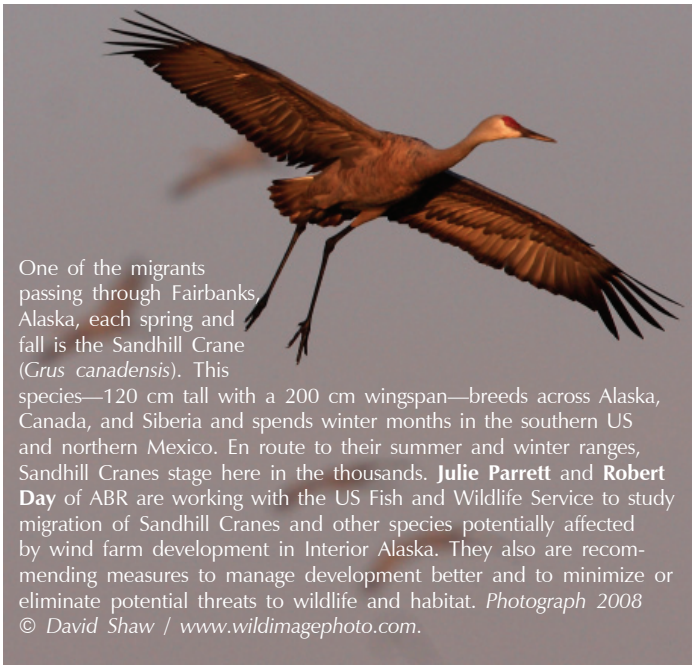
Understanding Global Climate Change: Work in Progress

ABR Scientist Torre Jorgenson working at Icy Cape, a headland in the Chukchi Sea, on the coast of the North Slope of Alaska.

ABR recognizes the gravity of global climate change, especially in the Arctic—a region of the world particularly sensitive to change. ABR scientist **Torre Jorgenson** is leading innovative research addressing the gaps in understanding many questions related to a warming climate. He is examining, for example, the consequences of coastal erosion in northern Alaska on village infrastructure and carbon inputs to arctic marine ecosystems. How much of this organic carbon, which has been sequestered in permafrost for thousands of years, becomes bioavailable to marine ecosystems and is released into the atmosphere is unknown. Yet, what happens as it crosses this narrow, transient zone, and how much returns to long-term sequestration in nearshore sediments, is crticial to understanding carbon budgets of the Arctic Ocean and to assessing feedbacks associated with climate and sea-ice changes.

Other studies Torre and his ABR colleagues are working on include assessing landscape change by characterizing and mapping terrain, studying ice-wedge characteristics across the arctic landscape, and predicting the responses of permafrost to disturbance. ABR has examined the feasibility of using remote sensing imagery and vegetation data from systematically distributed ground-based monitoring plots to evaluate landscape change. Other research involving the comparison of historical photographs with on-site assessments of the same location has revealed the nature and rate at which ecosystems are changing due to processess such as glacial retreat, the elevational and geographical expansion of tree line, and the recovery of vegetation in areas affected by volcanism.

Aerial view of severe erosion along the coastline at Icy Cape.



One of the migrants passing through Fairbanks, Alaska, each spring and fall is the Sandhill Crane (*Grus canadensis*). This species—120 cm tall with a 200 cm wingspan—breeds across Alaska, Canada, and Siberia and spends winter months in the southern US and northern Mexico. En route to their summer and winter ranges, Sandhill Cranes stage here in the thousands. **Julie Parrett** and **Robert Day** of ABR are working with the US Fish and Wildlife Service to study migration of Sandhill Cranes and other species potentially affected by wind farm development in Interior Alaska. They also are recommending measures to manage development better and to minimize or eliminate potential threats to wildlife and habitat. *Photograph 2008 © David Shaw / www.wildimagephoto.com.*

Renewable Energy: Wind Power

Wind power development is on the rise throughout North America and the world because of increasing demand for renewable energy. Whether construction is planned on federal or private lands, developers must determine the suitability of a site and a wind farm's potential impact on the environment.

ABR scientists have participated in over 60 projects related to bird and bat issues over the last 20 years, and we continue to be involved with both pre- and post-construction research issues in the US and Mexico. In addition to studying migratory birds and bats, we have developed a great number of analytical tools to model the exposure rate and potential collision risk with wind turbines for a diverse set of animals ranging from single species (Marbled Murrelets and Hawaiian Petrels) to groups of birds (e.g., raptors) and bats (long-distance migrants in particular).

—*Continues. See* Wind Power, *page 4*

Offshore Drilling: Seabird and Marine Mammal Research in the Chukchi Sea

Adrian Gall and Bob Day aboard the *Bluefin*.

ABR Senior Scientist **Robert H. Day** is coordinating oceanographic surveys in the northeastern Chukchi Sea where offshore oil exploration and development are being considered. These surveys include physical oceanography, nutrients and primary productivity, zooplankton ecology, and distribution and abundance of seabirds and marine mammals. Baseline data are being gathered for oil and gas producer ConocoPhillips Alaska, Inc., to inform the preparation of an Environmental Impact Statement and permits to drill for oil.

Of particular conservation concern are Yellow-billed Loons and Spectacled Eiders, but numerous species found in the area, such as Short-tailed Shearwater, Black-legged Kittiwake, and Crested Auklet, are among the seabirds potentially affected by human disturbance and habitat alteration. Among the marine-mammal species that inhabit these northern waters are ringed seal, bearded seal, walrus, and polar bear. A petition to list pagophillic (ice-loving) seals (ringed, spotted, and bearded) for protection is under review by NOAA's National Marine Fisheries Service.

EPA Transfers Federal Water Quality Permit Responsibility to Alaska

Alaska's Department of Environmental Conservation (ADEC) is taking over responsibility for National Pollutant Discharge Elimination System (NPDES) wastewater discharge permitting and compliance programs in Alaska beginning November 1, 2008. Senate Bill 110 authorizes the transfer in 4 phases over a 3-year period from U.S. Environmental Protection Agency primacy to the state.

Phase I: November 1, 2008
- Domestic discharges
- Timber harvesting, log storage, and transfer facilities
- Seafood processing facilities; hatcheries

Phase II: November 1, 2009
- Federal facilities
- Stormwater (construction and multisector general permits)
- Miscellaneous nondomestic discharges (e.g., utilities)
- Pretreatment program

Phase III: November 1, 2010
- Mining (individual hard rock and general permits)

Phase IV: November 1, 2011
- Oil and gas industry
- Cooling water intakes and discharges
- Munitions

For more information, go to *www.dec.state.ak.us/water/npdes*

Field Studies Underway for Alaska North Slope Gas Pipeline

ABR is conducting a field study for ConocoPhillips Alaska, Inc., in support of Denali–The Alaska Gas Pipeline project. The proposed route of the pipeline runs from Prudhoe Bay, Alaska, along the Trans Alaska Pipeline System route to Delta Junction, and then generally follows the Alaska Highway to the Alaska/Canada border. The study is designed to utilize and build upon past work performed by the Alaska Gas Producers Pipeline Team in compliance with the Federal Energy Regulatory Commission for contruction of pipelines. ABR Senior Scientist and Research Coordinator **Janet Kidd** is leading our research team conducting a wetlands survey and an ecological land survey (ELS) of the proposed route. The study includes classifying and mapping wetland and upland boundaries and performing field surveys to verify map boundaries. The ELS is a landscape-scale analysis that provides information on the wildlife value of the various habitats in the study area and the sensitivity of the terrain to disturbance. Go to *http://www.denali-thealaskagaspipeline.com/index.html* for more information.

From left: bear guard Chad Smith, and ABR research biologists Kate Beattie and Greg Mazer, working on the ecological land survey.

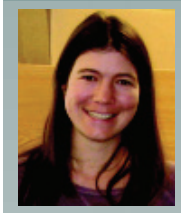
Bald Eagles: USFWS Guidelines for Land Managers & Bird Watchers

In August 2007, the Bald Eagle was removed from the federal list of threatened and endangered species in the lower 48 (the Alaska population of eagles was never listed). Even though they are delisted, Bald Eagles and their nest trees are still protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. These laws prohibit the "taking" of Bald and Golden Eagles or their nests. The US Fish & Wildlife Service defines "take" as "to pursue, shoot, target, poison, wound, kill, capture, trap, collect, molest, or disturb."

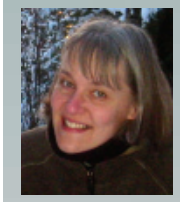
If you're planning construction or recreational activities, the timing when you conduct these activities is crucial to avoid disturbance. Both the presence of human activity (visual and auditory) near an eagle's nest, and the extent to which similar activities were already occurring near a nest, are known to disturb eagles, putting unhatched eggs or nestlings at risk. To make sure the Bald Eagle's recovery continues, the USFWS issued guidelines for land owners, developers, bird watchers, and others to help avoid disturbing nesting birds. See *http://alaska.fws.gov/birds/guidelines/* for specifics.

—*Continues. See* Bald Eagle, *page 4*

Staff Notes



Kate Beattie, *Research Biologist*, Fairbanks, specializes in vegetation studies, including rehabilitation, vascular and non-native plant inventories, and wetlands delineation.



Mette Moeller, *Accounting Assistant*, is helping keep up the smooth operation of ABR's Accounting Department in Fairbanks, which also oversees fiscal matters for the branch offices.

Chris Swingley, *IT Professional*, Fairbanks, oversees IT infrastructure for ABR's headquarters and branch offices. He also works with ABR scientists on database design, data analysis, and programming.

Aaron Wells, *Senior Scientist*, Fairbanks, is a plant and soil scientist whose expertise includes relating the distribution of plant communities across landscapes to environmental factors using mulivariate statistics.

Greg Mazer, *Research Biologist*, Fairbanks, is a wetland scientist with expertise in delineation, functions assessment and/or mitigation for various transportation and development projects.

In the Spotlight...

Torre Jorgenson was featured in *Alaska's Last Oil*, a film produced for National Geographic by Pangloss Films. It examines the worldwide search for oil in frontier areas of the globe, expanding oil development in Alaska, and exploration in more difficult offshore environments. Torre discusses retreating sea ice and sensitivity of permafrost to climate change in the film. A time-series analysis of permafrost degradation recently published by Torre in the American Geophysical Union's *Research Letters* is also discussed. See *http://channel.nationalgeographic.com/series/explorer/3105/Overview* for more information.

Ice wedge.

Andra Love, *Senior Scientist,* Anchorage, is an aquatic ecologist with expertise in macroinvertebrates and water quality. She is helping lead ABR's fisheries and aquatic sciences work in Alaska.

Cris Hein, *Research Biologist*, Forest Grove, is a bat ecologist and ornithologist leading ABR's avian and bat wind-energy studies across the country on issues such as collisions with wind turbines and habitat loss.

Leslie Rodman, *Research Biologist,* Forest Grove, is an applied ecologist with expertise in population dynamics of small mammals within disturbed and undisturbed habitats. She will be working on bat studies for ABR.

Recent ABR Publications

Person, B. T., **A. K. Prichard**, G. M. Carroll, D. A. Yokel, R. S. Suydam, and J. C. George. 2007. Distribution and movements of the Teshekpuk Caribou herd 1990–2005: prior to oil and gas development. Arctic 60: 238–250.

Cater, T. C., **M. T. Jorgenson**, **S. C. Bishop**, and C. L. Rea. 2008. Slope stabilization in an oilfield in arctic Alaska. Erosion Control 15 (January–February): 30–39.

Taft, O. W., **P. M. Sanzenbacher**, and S. M. Haig. 2008. Movement of wintering Dunlin *Calidris alpina* and changing habitat availability in an agricultural wetland landscape. Ibis 150: 541–549.

Conn, J. S., **K. L. Beattie**, M. A. Shephard, M. L. Carlson, I. Lapina, M. Hebert, R. Gronquist, R. Densmore, and M. Rasy. 2008. Alaska *Melitotus* invasions: distribution, origin, and susceptibility of plant communities. Arctic, Antarctic, and Alpine Research 40: 298–308.

Kunz, T. H., E. B. Arnett, **B. A. Cooper**, W. P. Erickson, R. P. Larkin, **T. J. Mabee**, M. L. Morrison, M. D. Strickland, and J. M. Szewzak. 2007. Assessing impacts of wind-energy development on nocturnally active birds and bats: a guidance document. Journal of Wildlife Management 71: 2449–2486.

Boehm, P. D., D. S. Page, J. M. Neff, and **C. B. Johnson**. 2007. Potential for Sea Otter exposure to remnants of buried oil from the *Exxon Valdez* oil spill. Environmental Science and Technology 41(19): 6860–6867.

Pullman, E. R., **M. T. Jorgenson**, and Y. Shur. 2007. Thaw settlement in soils of the Arctic Coastal Plain, Alaska. Arctic, Antarctic, and Alpine Research 39(3): 468–476.

Jorgenson, M. T., and Y. Shur. 2007. Evolution of lakes and basins in northern Alaska and discussion of thaw lake cycle. J Geophys. Res 112: 1017–1029.

Rea, C., **B. Ritchie**, **A. Stickney**, and **J. G. King**. 2007. Multi-year monitoring program for Tundra Swans on the North Slope of Alaska. Bulletin of the Trumpeter Swan Society 33(1): 136–139.

Visit ***http://abrinc.com/news/publications.htm*** for a complete list.

Bioshare

ABR's staff shares a sense of responsibility for the well being of our local and global communities. We try to meet this responsibility by providing resources, biological expertise, and our time through a program we call *Bioshare*.

Todd Mabee, Assistant Research Coordinator and Senior Scientist in ABR's Forest Grove office, is in the State of Oaxaca, Mexico, as part of an ABR-supported sabbatical. He is helping colleagues in Mexico develop protocols and research designs to observe the behavior of raptors as they pass over and through wind farms being constructed at La Venta II, where millions of raptors overfly during migration. Todd has extensive experience conducting avian migration studies at proposed wind farms.

Todd Mabee (center) with biologists from the Instituto de Ecologia at La Venta II wind project.

Forest Grove, OR, office with new solar panels.

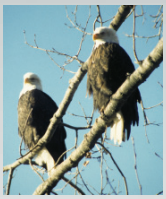
In an effort to reduce ABR's CO_2 footprint, we installed 16 solar panel arrays (175 kw each) on the roof of our Forest Grove office. Since March 2008, we have captured 3200 kw of power. Go to ABR's Carbon Account and Conservation Practices page for more information, *http://abrinc.com/about/carbonaccounting.htm.*

ABR newsletters can be accessed on our website, *http://abrinc.com/*

Wind Power *(continued from page 1)*

If you're interested in more information about wind energy, the federal Bureau of Land Management has a website with issues and guidelines related to development on public lands *(http://www.windeis.anl.gov/)*. The American Wind Energy Association offers a handbook with technical information and other resources for development on private lands, including guidelines on selecting suitable sites, assessing potential impacts, state and federal compliance, and other issues. It is available at *http://awea.org/policy/regulatory_policy/transmission.html*.

Bald Eagle *(continued from page 2)*



The USFWS also published a Draft Environmental Assessment (DEA) on 15 September 2008 for issuance of Bald and Golden Eagle permits that may allow limited disturbance at nesting sites on a case-by-case basis.

ABR, Inc.
P.O. Box 80410
Fairbanks, Alaska 99708
Return Address Requested